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DESIGN DIV.

**ART and SCIENCE in
ILLUMINATION**



63

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Trade-Marks and Designs.

The Enos Company

Makers of Lighting Fixtures

NEW YORK

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ART *and* SCIENCE *in* ILLUMINATION



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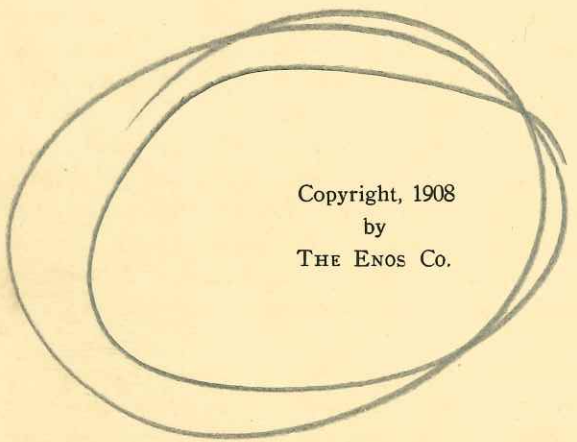
Office and Factory,
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NEW YORK

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ART AND SCIENCE IN ILLUMINATION

Since the earliest dawn of history the apparatus used for artificial lighting has been a subject of ornamental and artistic treatment. From the crudest forms of earthenware lamps to the most elaborate chandeliers, through every historical period, and among all nations the means for supporting lamps and candles for artificial lighting have received the most careful,—often the devout attention of master builders.

Until the advent of the electric light a little more than a quarter of a century ago there had been no essential change in the means of producing illumination; flames were the only sources of artificial light. The electric light marked a new epoch, and was the beginning of a revolution in lighting which is still only in the first stages of its progress.

So many, and so varied in effect, are the different light-sources at the present time, that illumination, which formed one of the earliest arts of man, has now become a science as well as an art. Formerly the lighting of a room was only a question of how many candles must be used. At the present time it is a question, not so much of the number of light-sources required, as of their kind, location, and the proper accessories to use with them.

To secure an illumination that is agreeable to the eyes, and harmonious in its effect, with apparatus artistically designed, and at a reasonable cost, involves a knowledge of the scientific principles underlying the production and use of light, as well as of the canons of art as applied to decorative design. This knowledge in our opinion should constitute the new science called Illuminating Engineering.

The most important part of the lighting fixture, so far as the resulting illumination is concerned, is the part that has heretofore been either wholly neglected, or considered only from the decorative standpoint, that is, the globes or shades. While little more than the satisfaction of artistic fancy could be accomplished in the shades used with the old light-sources, the latest improvements in electric lamps necessitate special attention being given to this essential part of a fixture in order to secure an illumination of satisfactory quality, without losing the advantages in economy which constitute the improvements. It is not uncommon for the ordinary globe or shade to absorb from a third to a half of all the light given out. While such a loss

may be justifiable in certain cases in order to secure special artistic results, such shades have not infrequently been as ugly as they were wasteful.

Realizing the present importance of the Science, as well as the Art of illumination, we some time since undertook a series of experiments for the purpose of devising a shade or reflector which should meet the requirements of illuminating engineering, i. e., utilize to the fullest extent the advantages in economy of the new light-sources, and which would at the same time lend itself to the artistic requirements of fixture design. These experiments have been brought to a particularly gratifying conclusion; we have produced a new reflector, which we believe will meet the approval alike of the strictly scientific illuminating engineer and the most artistic architect or client.

For a description of this reflector, we will quote from an article by Mr. L. R. Hopton in a recent issue of "The Illuminating Engineer."

"The several elements going to make up the perfect reflector or globe may be thus stated: efficiency in resulting illumination; artistic appearance; mechanical stability; ease of cleaning and minimum liability to become soiled; reasonable limits of cost.

"Efficiency of illuminating results practically depends upon a redistribution of the rays from the light-source. For this purpose reflection is undoubtedly the better means. Regular reflection, though the most highly efficient, is out of the question where general illumination is required, for various reasons which need not be enumerated here, chief among which is the practical doubling of the glare of the original source. Diffuse or irregular reflection, then remains as the one available means; in other words, the reflector with a diffusing surface affords the best means of securing efficiency in light distribution for general illumination. For this purpose dense white opal glass, sand blasted on the reflecting surface, undoubtedly takes the lead; but it has three objections which counterbalance its high reflecting power, namely; the very rapid decrease in reflecting power, by accumulation of soil and dust, opacity (a reflector for general illumination must transmit a sufficient amount of light to present deep shadows above), and a hopelessly inartistic appearance.

"Considering all these requisites, opalescent glass, and other means of deadening the surface than sand blasting or ordinary acid etching, were decided upon as the most promising line for experiments. After a considerable number of trials the glass manufacturer succeeded in producing a glass which is perceptibly translucent, but with a diffusing surface on the reflecting side. A new method was devised to produce this surface and it is entirely different from that produced by the ordinary etching, sand blasting or enameling. While the 'glaze' of the glass has been entirely removed, the surface

is of such high degree of smoothness that it can be cleaned as readily as that of ordinary glass, and at the same time it does not give sufficient direct reflection to produce perceptible glare. The reflected light from this glass is of a pearly lustre, slightly opalescent. The transmitted light shows a variation of soft color tints and illuminates the ceiling with a warm glow, entirely free from sharp contrasts in intensity. The ornamental detail has been designed to present no sharp corners or deep grooves, but an even surface very readily cleaned.

"As is well known, the curve resulting from a perfectly diffusing surface would be independent of the contour of the surface; and the more the reflection partakes of the regular, or specular nature, and the less of the diffusing nature, the more the distribution curve is influenced by the shape of the reflecting surface. Since in this glass the reflection is largely diffused, the contour or general shape of the reflector may be varied to several forms without materially changing the distribution curve and being made by pressing, they have ample mechanical strength. As reflection is entirely from the inner, or first surface, dust settling upon the outer surface has practically no effect upon efficiency, while the both surfaces are as easily cleaned as those of ordinary blown glass."

The mistake has been so frequently made of considering the globes and shades an entirely distinct and separable part of a fixture. From the artistic standpoint the glassware can no more be separated from the general design of a fixture than can the windows be considered apart from the general architecture of a building. Harmony and proportion of line, which are the most important elements in the decorative treatment of fixtures, necessarily include the outline or contour of the glassware. This especially holds true in the more simple designs, in which these elements constitute the greater part of the artistic feeling.

In order to maintain a complete harmony of line between fixture and reflector, we found it necessary to design a special holder. The old method of using a "stock" holder, and hiding it more or less with a "husk" placed over the socket, was unsatisfactory from the mechanical, as well as the artistic standpoint. The extension holders that have been designed for use with certain types of shades and lamps are also objectionable for the same reasons. We have, therefore, devised an entirely new holder to meet the requirements. It is attached back of the socket—the only method of attachment that is mechanically sound—and extends down over the socket with a graceful outline, thus forming an integral part of the fixture. A bead is rolled on the open end, which is slotted so as to form a circle of spring clips, which firmly grasp the neck of the reflector, while permitting it to be instantly removed

or replaced when required. There are no set-screws to work loose or become rusted fast.

We are designers and makers of lighting fixtures and have been in business for 43 years, during which time we have designed and executed many of the most elaborate and representative installations in this country. Our work has extended into every state in the Union. While we have given particular attention to the design of special fixtures to carry out the spirit of the architecture of such representative buildings as public libraries, municipal buildings, court-houses, churches, hotels and private mansions, we have by no means neglected the wants of the more modest installation, but have given the same careful and conscientious effort to the construction of even the simplest forms of lighting fixtures, believing that good taste, good workmanship, and good results in illumination should apply to the simplest and least expensive, as well as to the most elaborate and pretentious.

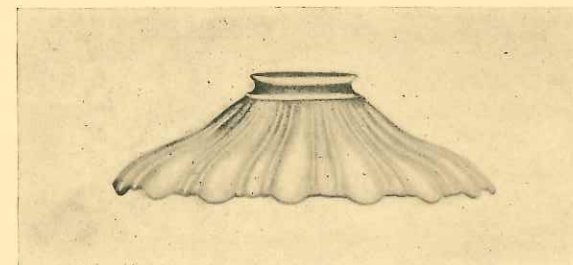
To demonstrate the possibilities in the combination of the science of illuminating engineering with the principles of decorative art, we have designed a series of fixtures which are illustrated in the following pages. It should be understood, however, that these are merely examples showing the use of our new reflector and holder, and its adaptability to artistic treatment, rather than a general catalogue.

Our special aim has always been, and will continue to be, to design and construct lighting fixtures to fulfil the exact requirements of each special problem. Our success in meeting all requirements has been sufficiently recognized. It is our purpose not only to maintain the reputation which we have thus acquired, but to keep fully abreast of progress in the domain of lighting.

We will be pleased to co-operate with architects and patrons in laying out lighting installations so that the required intensity and quality of illumination may be secured with the greatest economy, as well as the highest degree of artistic harmony in design.

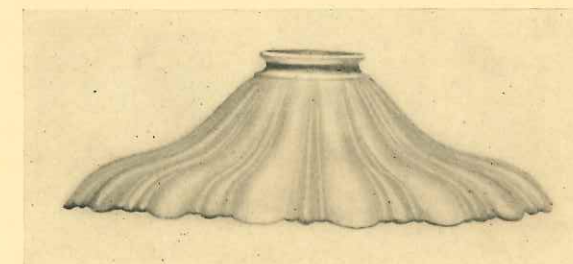
TYPES OF REFLECTORS

ALL REFLECTORS HAVE STANDARD 2 1-4 IN. LIPS.
FLAT OR DISTRIBUTING TYPES.



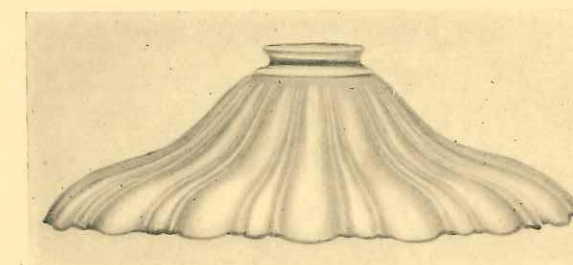
NO. F1. USED WITH SHORT HOLDERS.
2 1-2 IN. DEEP. 8 IN. DIAM.

RECOMMENDED FOR USE WITH
16 CP CARBON (REGULAR) LAMPS 25 AND 40 WATT TANTALUM LAMPS
50 WATT GEM LAMPS 25 WATT TUNGSTEN LAMPS
40 WATT TUNGSTEN LAMPS (WITH LONG HOLDERS)



NO. F2. USED WITH LONG HOLDERS.
3 1-4 IN. DEEP. 10 IN. DIAM.

RECOMMENDED FOR USE WITH
32 CP. CARBON LAMPS (SHORT HOLDERS) 80 WATT TANTALUM LAMPS
100 WATT GEM LAMPS 60 WATT TUNGSTEN LAMPS



NO. F3. USED WITH LONG HOLDERS.
3 7-8 IN. DEEP. 11 1-4 IN. DIAM.

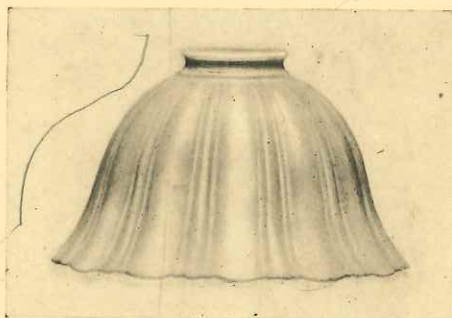
RECOMMENDED FOR USE WITH
125 WATT GEM LAMPS
100 WATT TUNGSTEN LAMPS

SHADE OR BOWL TYPES.



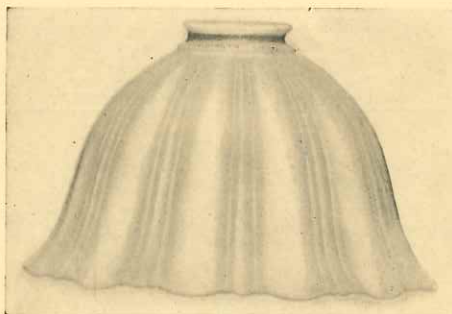
NO. S1. USED WITH SHORT HOLDERS.
4 IN. DEEP. 6.5-8 IN. DIAM.

RECOMMENDED FOR USE WITH
16 CP. CARBON (REGULAR) LAMPS 25 AND 40 WATT TANTALUM LAMPS
50 WATT GEM LAMPS 25 WATT TUNGSTEN LAMPS
40 WATT TUNGSTEN LAMPS (WITH LONG HOLDERS)



NO. S2. USED WITH LONG HOLDERS.
4.1-2 IN. DEEP. 7.5-8 IN. DIAM.

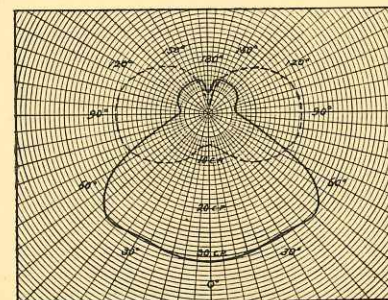
RECOMMENDED FOR USE WITH
32 CP. CARBON LAMPS (SHORT HOLDERS) 80 WATT TANTALUM LAMPS
100 WATT GEM LAMPS 60 WATT TUNGSTEN LAMPS



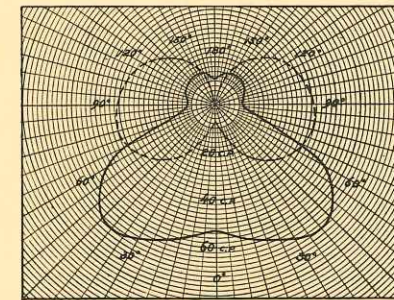
NO. S3. USED WITH LONG HOLDERS.
5.3-8 IN. DEEP. 8.3-4 IN. DIAM.

RECOMMENDED FOR USE WITH
125 WATT GEM LAMPS 100 WATT TUNGSTEN LAMPS

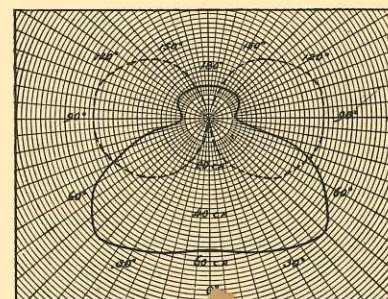
PHOTOMETRIC CURVES



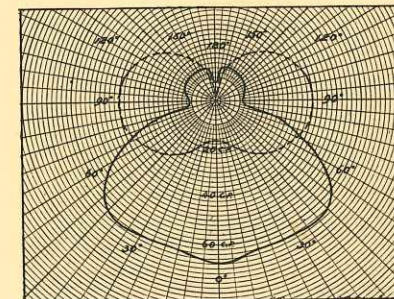
NO. S1. WITH 50-WATT CLEAR
BULB GEM LAMP.



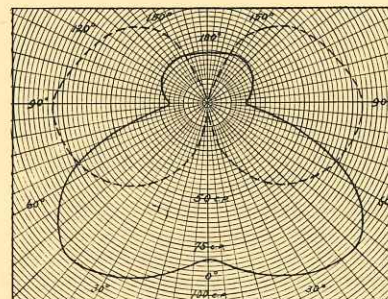
NO. S2. WITH 80-WATT CLEAR
BULB TANTALUM LAMP.



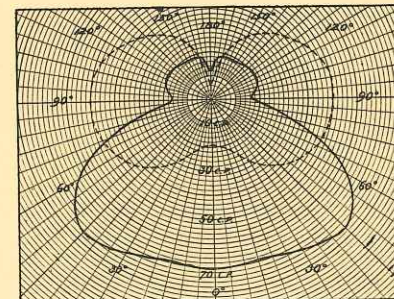
NO. S2. WITH 60-WATT CLEAR
BULB TUNGSTEN LAMP.



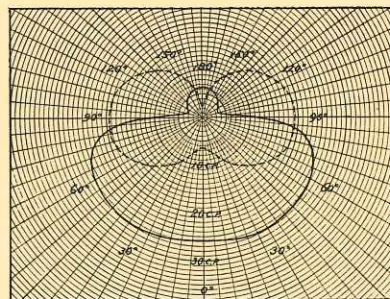
NO. S2. WITH 100-WATT CLEAR
BULB GEM LAMP.



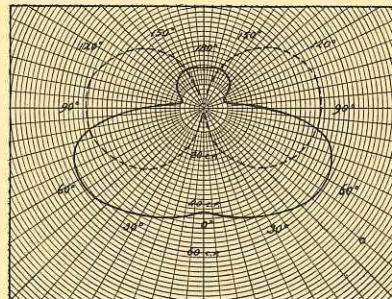
NO. S3. WITH 100-WATT CLEAR
BULB TUNGSTEN LAMP.



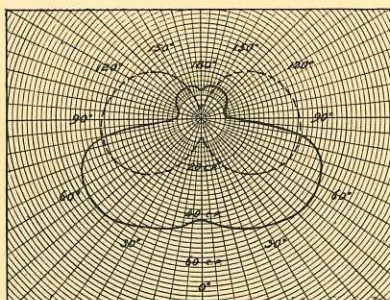
NO. S3. WITH 125-WATT CLEAR
BULB GEM LAMP.



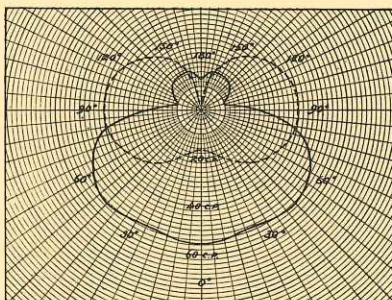
NO. F1. WITH 50-WATT CLEAR BULB GEM LAMP.



NO. F2. WITH 60-WATT CLEAR BULB TUNGSTEN LAMP.

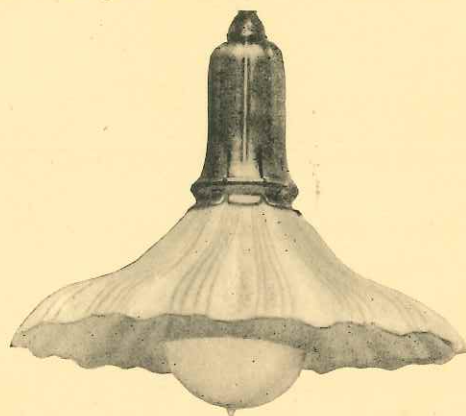


NO. F2. WITH 80-WATT CLEAR BULB TANTALUM LAMP.



NO. F2. WITH 100-WATT CLEAR BULB GEM LAMP.

All of the curves shown are from tests made by the Electrical Testing Laboratories, New York. Full-size blue prints from the original reports will be gladly sent on request.



TYPE F REFLECTOR AND ENOS SPECIAL HOLDER.

FINISHES

Prices given include reflectors, Edison sockets, wiring and tripod, but do not include lamps.

Prices given are for any of the following finishes:—

Polished Brass	Old Brass
Polished Brass and Black	Old Brass and Black
Rich Gilt	Stained Old Brass
Venetian and Gilt	

If other finishes are desired add 10 per cent. for

Antique Copper	Japanese Old Brass
Mottled Copper	Statuary Bronze
Oxidized Copper	Half Finished Iron
Nickel	Green Bronze Finishes

Add 20 per cent. for

Antique Silver	Butler's Silver
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DIMENSIONS

Lengths of fixtures are measured from the top to the lowest point of lamp. The spread is measured from centers of lamps.

EXTRA LENGTHENING

The regular lengths of fixtures are those given. Should extra lengths be desired, the additional cost will be as follows:—

$\frac{3}{8}$ in. tube.....	60c per foot
$\frac{3}{4}$ in. tube.....	60c per foot
$\frac{7}{8}$ in. tube.....	70c per foot
1 in. tube.....	70c per foot
Lengthening of fixtures with chain stems..	\$1.50 per foot

Goods shipped F. O. B. New York.

Boxing and packing extra at cost.

Glassware shipped at customer's risk.

No claims for shortage or damage considered unless received within ten days of receipt of goods.

Discounts to the trade will be quoted on application.



NO. 13120.
LENGTH 12 IN.

1 ELEC. F1 OR S1 REFLECTOR..	\$4.90
1 " F2 " S2 "	.. 5.00
1 " F3 " S3 "	.. 5.20



NO. 13119.
LENGTH 11 1-2 IN.

1 ELEC. F1 OR S1 REFLECTOR..	\$3.50
1 " F2 " S2 "	.. 3.60
1 " F3 " S3 "	.. 3.80



NO. 13118.
LENGTH 14 1-2 IN.

1 ELEC. F1 OR S1 REFLECTOR..	\$3.40
1 " F2 " S2 "	.. 3.50
1 " F3 " S3 "	.. 3.70

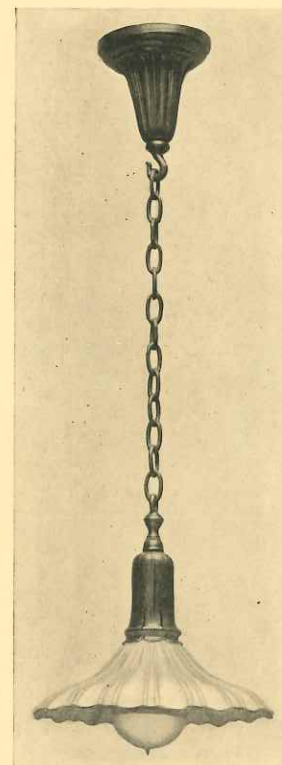


NO. 13121.
LENGTH 10 IN.

1 ELEC. F1 OR S1 REFLECTOR..	\$7.40
1 " F2 " S2 "	.. 7.50
1 " F3 " S3 "	.. 7.70

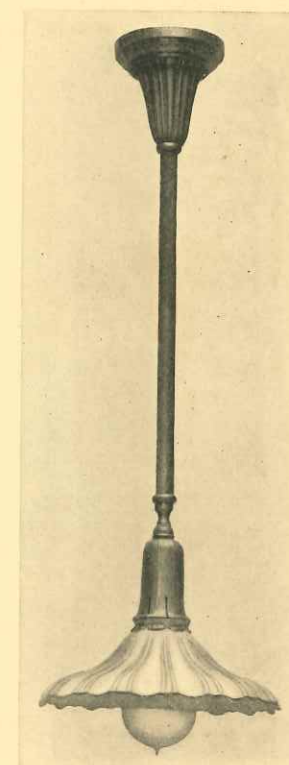


NO. 13128.
LENGTH 14 1-2 IN. . . . SPREAD 16 1-2 IN.
4 ELEC. S1 OR F1 REFLECTORS.....\$20.60
4 " S2 " F2 " 21.00
4 " S3 " F3 " 21.80



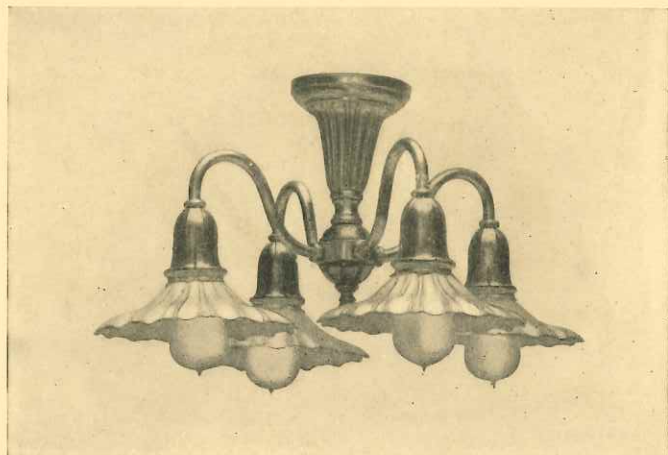
NO. 13123.
LENGTH 30 IN.

1 ELEC. F1 OR S1 REFLECTOR..	\$6.40
1 " F2 " S2 "	.. 6.50
1 " F3 " S3 "	.. 6.70



NO. 13122.
LENGTH 30 IN.

1 ELEC. F1 OR S1 REFLECTOR..	\$3.90
1 " F2 " S2 "	.. 4.00
1 " F3 " S3 "	.. 4.20



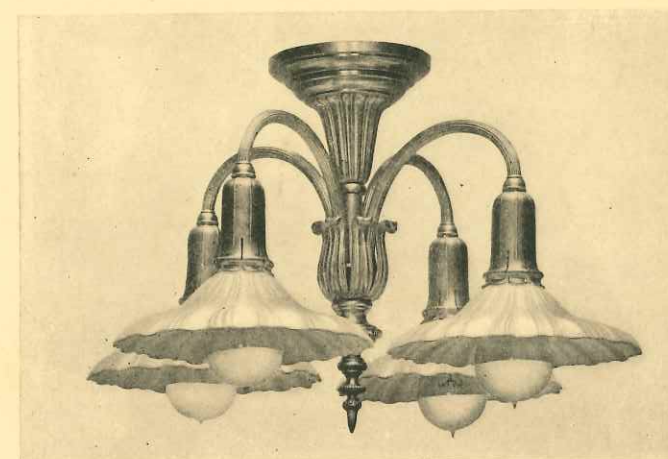
LENGTH 9 1-2 IN.			NO. 13124	SPREAD 16 IN.
3	ELEC.	F1 OR S1 REFLECTORS		\$13.00
4	"	F1 " S1 "		16.00
3	"	F2 " S2 "		13.30
4	"	F2 " S2 "		16.40
3	"	F3 " S3 "		13.90
4	"	F3 " S3 "		17.20



LENGTH 13 IN.			NO. 13127	SPREAD 16 IN.
4	ELEC.	F1 OR S1 REFLECTORS		\$28.00
5	"	F1 " S1 "		32.00
3	"	F2 " S2 "		24.30
4	"	F2 " S2 "		28.40
3	"	F3 " S3 "		24.90
4	"	F3 " S3 "		29.20



LENGTH 11 1-2 IN.			NO. 13132	SPREAD 18 IN.
2	ELEC.	F1 OR S1 REFLECTORS		\$14.80
3	"	F1 " S1 "		18.70
4	"	F1 " S1 "		22.60
2	"	F2 " S2 "		15.00
3	"	F2 " S2 "		19.00
4	"	F2 " S2 "		23.00
2	"	F3 " S3 "		15.40
3	"	F3 " S3 "		19.60
4	"	F3 " S3 "		23.80



LENGTH 16 IN.			NO. 13126	SPREAD 16 IN.
4	ELEC.	F1 OR S1 REFLECTORS		\$24.60
5	"	F1 " S1 "		27.50
3	"	F2 " S2 "		22.00
4	"	F2 " S2 "		25.00
3	"	F3 " S3 "		22.60
4	"	F3 " S3 "		25.80



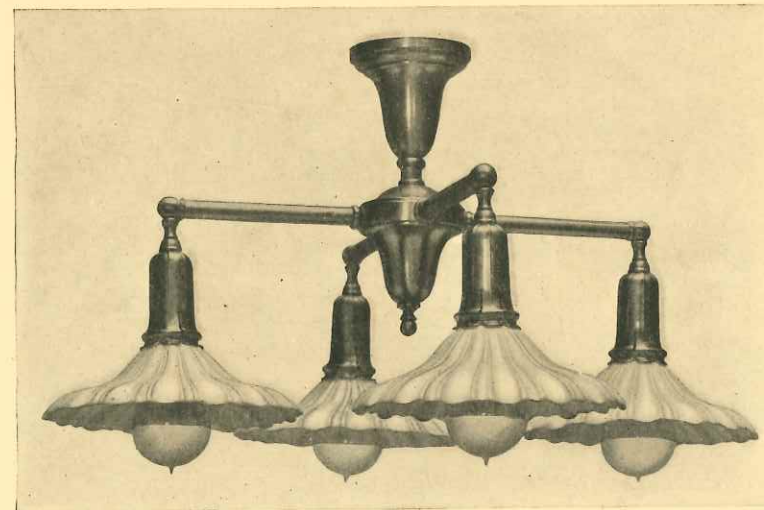
NO. 13131.

LENGTH 13 IN.				SPREAD 18 IN.	
2	ELEC.	F1	OR S1 REFLECTORS.		\$11.30
3	"	F1	" S1	"	14.70
4	"	F1	" S1	"	18.10
2	"	F2	" S2	"	11.50
3	"	F2	" S2	"	15.00
4	"	F2	" S2	"	18.50
2	"	F3	" S3	"	11.90
3	"	F3	" S3	"	15.60
4	"	F3	" S3	"	19.30



NO. 13125.

LENGTH 12 IN.				SPREAD 17 1-2 IN.	
4	ELEC.	F1	OR S1 REFLECTORS.		\$23.10
5	"	F1	" S1	"	31.50
3	"	F2	" S2	"	25.00
4	"	F2	" S2	"	28.50
3	"	F3	" S3	"	25.60
4	"	F3	" S3	"	29.30



NO. 13129.

LENGTH 12 IN.				SPREAD 20 IN.	
2	ELEC.	F1	OR S1 REFLECTORS.		\$11.30
4	"	F1	" S1	"	17.10
2	"	F2	" S2	"	11.50
4	"	F2	" S2	"	17.50
2	"	F3	" S3	"	11.90
4	"	F3	" S3	"	18.30



NO. 13130.

LENGTH 13 IN.				SPREAD 18 1-2 IN.	
2	ELEC.	F1	OR S1 REFLECTORS.		\$12.80
3	"	F1	" S1	"	16.70
4	"	F1	" S1	"	20.60
2	"	F2	" S2	"	13.00
3	"	F2	" S2	"	17.00
4	"	F2	" S2	"	21.00
2	"	F3	" S3	"	13.40
3	"	F3	" S3	"	17.60
4	"	F3	" S3	"	21.80



NO. 7717.

LENGTH 36 IN.				SPREAD 30 IN.	
2	ELEC.	S1 OR F1	REFLECTORS		\$14.80
3	"	S1	" F1	"	19.70
4	"	S1	" F1	"	24.60
2	"	S2	" F2	"	15.00
3	"	S2	" F2	"	20.00
4	"	S2	" F2	"	25.00
2	"	S3	" F3	"	15.40
3	"	S3	" F3	"	20.60
4	"	S3	" F3	"	25.80



NO. 7718.

LENGTH 36 IN.				SPREAD 24 IN.	
2	ELEC.	S1 OR F1	REFLECTORS		\$18.80
3	"	S1	" F1	"	23.70
4	"	S1	" F1	"	28.60
2	"	S2	" F2	"	19.00
3	"	S2	" F2	"	24.00
4	"	S2	" F2	"	29.00
2	"	S3	" F3	"	19.40
3	"	S3	" F3	"	24.60
4	"	S3	" F3	"	29.80



NO. 7719.

LENGTH 40 IN.				NO. 7719.		SPREAD 21 IN.	
5	ELEC.	4	ARMS AND CENTRE.	S1	OR F1	REFLECTORS.....	\$103.50
6	"	5	" " "	S1	" F1	"	119.40
5	"	4	" " "	S2	" F2	"	104.00
6	"	5	" " "	S2	" F2	"	120.00
5	"	4	" " "	S3	" F3	"	105.00
6	"	5	" " "	S3	" F3	"	121.20

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